



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,849	11/30/2000	Jong Jin Park	2658-0252P	8778

2292 7590 06/13/2003

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

AWAD, AMR A

ART UNIT PAPER NUMBER

2675

DATE MAILED: 06/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites "a period of discharging of the liquid crystal cell is short relative to a period that the liquid crystal cell is completely discharged". This limitation is not clear to the examiner because there is no mention of what is the discharging period is and what is the different between the complete discharging and the discharging. The Examiner respectfully requests a clarification or correction.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

Art Unit: 2675

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 4-5, 8 and 11-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Takahashi (US patent NO. 6,297,792).

As to independent claim 1, Takahashi (figure 6) teaches a liquid crystal display (10) that includes a liquid crystal pixel cells (16) arranged at each intersection between a plurality of lines (Y1-Ym) and a plurality of data lines (X1-Xn) in a matrix type and being driven with thin film transistors (40 in figures 4 and 5) (col.11, lines 28-52). Takahashi teaches applying a first signal to the liquid crystal pixel cells for charging thereof during the beginning of a frame (period) and applying a second signal to the liquid crystal pixel cells for discharging thereof during an ending of the frame (period) (abstract, col. 14, lines 45-63, col. 15, lines 41-63, col. 19, lines 18-39, and figures 8a-8d and 9a-9b).

As to claim 4, as can be seen from figures 8a-8d and 9a-9b; the gate pulse is applied twice during one period (first half of the period and the second half of the period) (abstract).

As to claim 5, Takahashi (figure 6) teaches a liquid crystal display (10) that includes a liquid crystal pixel cells (16) arranged at each intersection between a plurality of lines (Y1-Ym) and a plurality of data lines (X1-Xn) in a matrix type and being driven with thin film transistors (40 in figures 4 and 5) (col.11, lines 28-52). Takahashi teaches applying a first signal to the liquid crystal pixel cells for charging thereof during the beginning of a frame (period) and applying a second signal to the liquid crystal pixel cells for discharging thereof during an ending of the frame (period) (abstract, col. 14,

Art Unit: 2675

lines 45-63, col. 15, lines 41-63, col. 19, lines 18-39, and figures 8a-8d and 9a-9b).

Figures 8a-8d and 9a-9b); the gate pulse is applied twice during one period (first half of the period and the second half of the period) (abstract).

As to claim 8, Takahashi teaches generating gate pulse (scanning pulse) at a start of the frame and a midpoint of the frame (col. 14, lines 41-63).

As to claim 11, Takahashi teaches a liquid crystal display that includes applying a first signal to the liquid crystal pixel cells for charging thereof during the beginning of a frame (period) and applying a second signal to the liquid crystal pixel cells for discharging thereof during an ending of the frame (period) (abstract, col. 14, lines 45-63, col. 15, lines 41-63, col. 19, lines 18-39, and figures 8a-8d and 9a-9b). Figures 8a-8d and 9a-9b.

As to claim 12, as best understood by the examiner, Takahashi teaches a discharging period takes most time in one period (see figures 8a-8d).

As to claim 13, figures 8a-8d substantially read on the claims by having a pulse of one polarity in the beginning of the period and then substantially no charges are applied in the middle, and a pulse of opposite polarity at the end (col. 14, lines 41-63).

As to claim 14, as can be seen from figures 8a-8d and 9a-9b; the gate pulse is applied twice during one period (first half of the period and the second half of the period) (abstract).

As to claim 15, Takahashi in figures 8a-8b teaches having a video data signal (TV signals) to charge the pixel element.

Art Unit: 2675

As to claim 16, as discussed above , since the starting of the discharge is at the second half of the period; then the gate pulse is applied at the mid-point.

As to claim 17, the claim includes substantial limitations as the one introduced in claim 13 and would be analyzed substantially similar.

As to claim 18, the claim is similar to claim 13 and analyzed as previously discussed with respect to claim 13.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-3 and 6-7 rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi in view of Miwa et al. (US patent NO. 6,3~~69~~⁹⁶,469; hereinafter referred to as Miwa).

As to claims 2 and 6, Takahashi teaches all the limitations of claims 2 and 6 except the citation that the liquid crystal layer formed of any one of ferro-electric liquid crystal and an anti-ferro-electric liquid crystal.

However, Miwa teaches a liquid crystal display system that includes applying in one frame period, first and second signal (figure 3, abstract and col. 4, lines 4-18), and wherein a ferro-electric display can be used (col. 5, lines 47-52).

Art Unit: 2675

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Miwa's teaching having a ferro-electric display to be used in Takahashi's device because as it is known in the art, ferro-electric display has a good memory characteristics, and uses less power.

As to claims 3 and 7, Takahashi teaches all the limitations of claims 3 and 7 except the citation that the liquid crystal display includes a liquid crystal layer formed of twisted nematic liquid crystal having a response speed of less than 10ms.

However, Miwa teaches a twisted-nematic liquid crystal display which has a response time of less than 10ms (in Miwa's device, the response time is between 2-5ms) (col. 52-65).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teaching of Miwa having a response time of less than 10ms to be included in Takahashi's device so as to have a high response time and to have a liquid crystal display with a characteristics similar to those of CRT (see Miwa, col. 5, lines 60-65).

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi in view Kubota et al. (US patent NO. 5,907,313; hereinafter referred to as Kubota).

Takahashi teaches all the limitations of claims 19 except the citation that the gate driver includes a plurality of gate driver circuits connected together in series.

Art Unit: 2675

However, Kubota (figure 9) teaches a liquid crystal display device that includes a plurality of gate drivers connected in series (col. 4, lines 23-37).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the teaching of Kubota having a plurality of gate drivers connected in series to be incorporated to Takahashi so as to increase the speed of the display.

Allowable Subject Matter

9. Claims 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: None of the cited references either singularly or in combination teaches or fairly suggests a liquid crystal display that includes among other features; a data compressor to compress a first signal synchronized with the frame front region of the frame; and data controller to write a second signal during the ending of the frame to apply the second signal to the data driver.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Okada et al. (US patent NO. 4,778,260) teaches a ferro-electric display and its method for driving.

Art Unit: 2675

Aoki et al. (US Patent NO. 6,307,681) teaches an electro-optical device that produces precharge signals.

Inoue (US patent NO. 6,342,881) teaches a display device and a charge-precharge drive method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amr Awad whose telephone number is (703)308-8485. The examiner can normally be reached on Monday-Friday, between 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Saras can be reached on (703)305-9720. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4750.

A handwritten signature in black ink that reads "Amr Awad". The signature is written in a cursive style with a long, sweeping tail.

A.A
June 9, 2003